UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R036XB128NM

Site Name: Clayey

Precipitation or Climate Zone: 10-16"

Phase:

PHYSIOGRAPHIC FEATURES

Narrative:

This site occurs on moderately sloping valley side slopes. It can also occur as sloping benches or rolling hills above valley bottoms and floodplain positions. Slopes range from 5 to 15 percent. Elevations range from 6,000 to 7,300 feet.

Land Form:

1. hillside
2. valley side
3. sloping benches

Aspect:

1. not significant
2.
3.

	Minimum	Maximum
Elevation (feet)	5900	7800
Slope (percent)	1	24
Water Table Depth (inches)	--	--

Flooding:	Minimum	Maximum
Frequency	none	rare
Duration	none	Very brief

Ponding:	Minimum	Maximum
Depth (inches)	--	--
Frequency	--	--
Duration	--	--

Runoff Class:

Medium to very high

Hydrologic units B, C & D

CLIMATIC FEATURES

Narrative:

Average annual precipitation varies from about 10 inches to just over 16 inches. Fluctuations ranging from about 5 inches to 25 inches are not uncommon. The overall climate is characterized by cold dry winters in which winter moisture is less than summer. As much as half or more of the annual precipitation can be expected to come during the period of July through September. Thus, fall conditions are often more favorable for good growth of cool-season perennial grasses, shrubs, and forbs than are those of spring.

The average frost-free season is about 120 days and extends from approximately mid-May to early or mid-September. Average annual air temperatures are 50 degrees F or lower and summer maximums rarely exceed 100 degree F. Winter minimums typically approach or go below zero. Monthly mean temperatures exceed 70 degree F for the period of July and August.

Rainfall patterns generally favor warm-season perennial vegetation, while the temperature regime tends to favor cool-season vegetation. This creates a somewhat complex community of plants on a given range site which is quite susceptible to disturbance and is at or near its productive potential only when both the natural warm- and cool- season dominants are present.

	Minimum	Maximum
Frost-free period (days):	51	171
Freeze-free period (days):	130	252
Mean annual precipitation (inches):	10	16

Monthly moisture (inches) and temperature (^{0}F) distribution:

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January	.40	.91	12.9	47.0
February	.43	.65	16.6	51.2
March	.47	1.10	20.9	57.1
April	.30	.49	26.1	65.3
May	.46	.98	33.4	74.2
June	.51	.57	41.4	84.2
July	2.15	3.45	50.4	85.1
August	2.28	3.03	48.7	82.4
September	1.29	1.68	41.4	77.9
October	.81	1.12	29.4	69.2
November	.38	.71	19.1	57.3
December	.53	.95	13.1	48.9

Climate Stations:

					Period		
Station ID	290640	Location	Augustine 2E	From:	05/01/26	To:	07/31/00
Station ID	296812	Location	Pietown 19NE	From:	09/01/88	To:	07/31/00
Station ID	297180	Location	Quemado	From:	08/01/15	To:	07/31/00

Period

INFLUENCING WATER FEATURES

Narrative:

This site is not influenced by water from wetlands or streams.

Wetland description:

System	Subsystem	Class
N/A		

If Riverine Wetland System enter Rosgen Stream Type:

N/A

REPRESENTATIVE SOIL FEATURES

Narrative:

Soils are typically moderately fine to fine-textured on the surface (clay loam, clay, silty clay loam) over fine textured subsoils. They are usually deep, but may be moderately deep. Water intake rates are slow to moderately slow. Permeability is slow, and water-holding capacity is high. Runoff from this site is usually excessive in the absence of adequate vegetative cover. It may also be excessive during periods of heavy rainfall or spring snowmelt. The erosion hazard is high when the vegetative cover deteriorates.

Parent Material Kind: alluvium

Parent Material Origin: Mixed- derived from shale and sandstone

Surface Texture:

1. clay
2. silty clay loam
3. clay loam

Surface Texture Modifier:

1. N/A
2.
3.

Subsurface Texture Group: N/A

Surface Fragments <=3" (% Volume): --

Surface Fragments >3" (% Volume): --

Subsurface Fragments <=3" (%Volume): 2-36

Subsurface Fragments >=3" (%Volume): -- -2

	Minimum	Maximum
Drainage Class:	--	well
Permeability Class:	impermeable	Moderately slow
Depth (inches):	0	75
Electrical Conductivity (mmhos/cm):	0.00	8.00
Sodium Absorption Ratio:	0.00	13.00
Soil Reaction (1:1 Water):	6.6	9.0
Soil Reaction (0.1M CaCl2):	--	--
Available Water Capacity (inches):	2	8
Calcium Carbonate Equivalent (percent):	--	--

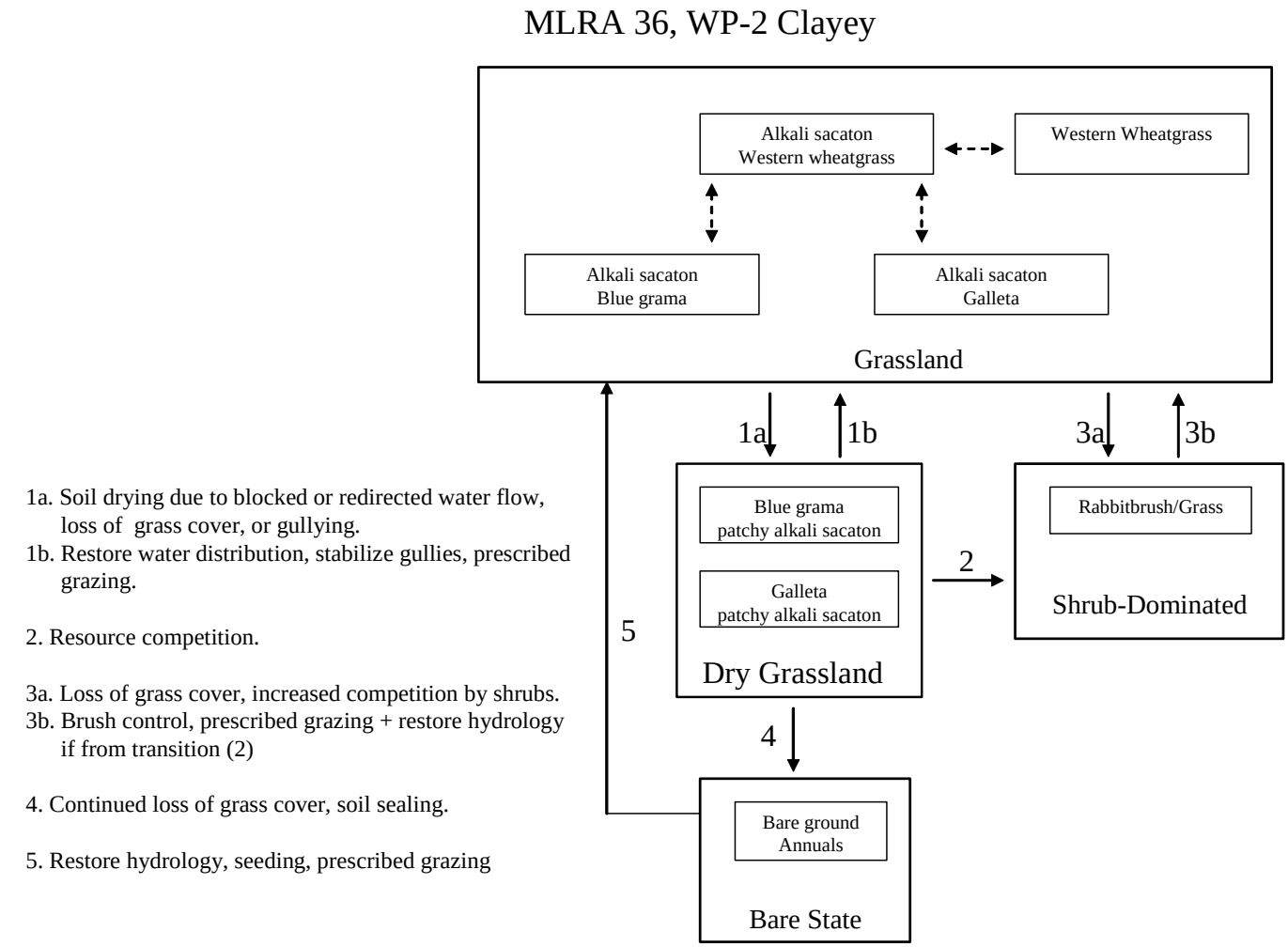
PLANT COMMUNITIES

Ecological Dynamics of the Site:

Overview

This site occurs on flood plains, valley sides, sideslopes of hills and mesa tops. It is associated with Loamy, Clayey Bottomland, and Malpais sites. It occurs as a distinct unit adjacent to or as part of a mosaic with these sites. The historic plant community of the Clayey site is a grassland characterized by both warm and cool-season grasses, scattered shrubs, and forbs. The clayey site is dominated by alkali sacaton and western wheatgrass. Fourwing saltbush and winterfat are common shrubs. Forbs can occur in high relative abundance in years with above-average rainfall. Decreased available soil moisture due to blocked or redirected flow of run-on water, loss of grass cover, and gullying can cause a transition to a less productive Dry Grassland State. Continued loss of grass cover and soil surface sealing may result in a state with extensive areas of bare ground. Loss of grass cover and decreased soil moisture can decrease competition by grasses, facilitating shrub encroachment and result in a Shrub-Dominated state.

Plant Communities and Transitional Pathways (diagram)



1a. Soil drying due to blocked or redirected water flow, loss of grass cover, or gullying.
1b. Restore water distribution, stabilize gullies, prescribed grazing.

2. Resource competition.

3a. Loss of grass cover, increased competition by shrubs.
3b. Brush control, prescribed grazing + restore hydrology if from transition (2)

4. Continued loss of grass cover, soil sealing.

5. Restore hydrology, seeding, prescribed grazing

MLRA 36; WP-2; Clayey

Grassland

•Alkali sacaton, western wheatgrass, galleta with scattered 4-wing saltbush and winterfat.
•Grass cover fairly uniform
•Hawaikuh silt loam, McKinley Co., NM.

Dry-Grassland

•Blue grama, galleta, with clumps of alkali sacaton and scattered 4-wing saltbush.
•Grass cover patchy with large bare areas.
•Bare areas sealed by physical crusts
•Hawaikuh silt loam, McKinley Co., NM.

Plant Community Name: Historic Climax Plant Community

Plant Community Sequence Number: 1 Narrative Label: HCPC

Plant Community Narrative:

State Containing Historic Plant Community

Grassland State: The historic plant community is dominated by alkali sacaton and western wheatgrass. Other important grasses that appear on this site include galleta, blue grama, and bottlebrush squirreltail. Fourwing saltbush and winterfat are the dominant shrubs. Rabbitbrush and broom snakeweed may also be sparsely scattered across the site. Continuous heavy grazing will typically cause a decrease in western wheatgrass. A community dominated by alkali sacaton with blue grama or galleta as the subdominant may result. In other instances, especially on the heavier textured clay soils, a sparser, less productive, near monotypic stand of western wheatgrass may persist.

Diagnosis: Grass cover is uniform with few large bare connected areas present. Shrubs are scattered with canopy cover averaging five percent or less. Evidence of erosion such as pedestalling of grasses, rills and gullies are infrequent.

Ground Cover (Average Percent of Surface Area).	
Grasses & Forbs	25
Bare ground	65
Surface gravel	
Surface cobble and stone	--
Litter (percent)	10-15
Litter (average depth in cm.)	0-1
Surface Gravel (% cover)	

Plant Community Annual Production (by plant type):

	Annual Production (lbs/ac)		
Plant Type	Low	RV	High
Grass/Grasslike	600	750	900
Forb	60	75	90
Tree/Shrub/Vine	80	100	120
Lichen	--	--	--
Moss	--	--	--
Microbiotic Crusts	--	--	--
Totals	800	1000	1200

Plant Community Composition and Group Annual Production:

Plant Type - Grass/Grasslike

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
1	SPAI SPWR2	Alkali sacaton Giant sacaton	200-250	200-250
2	PASM	Western wheatgrass	200-300	200-300
3	PLJA	Galleta	100-150	100-150
4	BOGR2	Blue grama	50-200	50-200
5	PAOB	Vine-mesquite	0-50	0-50
6	ELEL5 ACHY	Bottlebrush squirreltail Indian ricegrass	50-100	50-100
7	MUWR	Spike muhly	30-50	30-50
8	MURI	Mat muhly	10-50	10-50
9	SPORO	Dropseed spp.	10-50	10-50
10	--	others	10-50	10-50

Plant Type - Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
11	ATCA2 KRLA2	Fourwing saltbush Winterfat	50-100	50-100
12	GUSA2 ERNAN5	Broom snakeweed Rabbitbrush	10-50	10-50

Plant Type – Forb

13	2FP	Perennial forbs	10-80	10-80
14	2FA	Annual forbs	10-50	10-50

Plant Type - Lichen

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Moss

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Microbiotic Crusts

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Growth Curves

Growth Curve ID NM 0318

Growth Curve Name: HCPC

Growth Curve Description: WP-2 Clayey - HCPC Warm/Cool season perennial plant community.

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	0	8	15	10	9	20	25	8	5	0	0

Additional States:

Dry Grassland: This site is characterized by decreased available soil moisture, decrease in grass cover and a change in species composition. Typically galleta or blue grama is the dominant grass species. Alkali sacaton, if present, is generally found in clumps or tussocks with interconnected bare areas between plants, or in patches on wetter low-lying spots.

Diagnosis: Grass cover is typically patchy with large interconnected bare areas present. Blue grama or galleta is the dominant grass species. Rills, gullies, or obstructions to overland flow are present.

Transition to Dry Grassland (1a): Soil drying due to blocked or redirected flow of run-on water, loss of grass cover, or gullying are thought to initiate this transition. Water retention or diversion structures, sediment deposition, or roads may block or divert water that would naturally flow onto the site. Roads or trails may concentrate water during high flow periods and facilitate gully formation. Loss of adequate grass cover due to overgrazing can decrease infiltration, increase flow rates, and initiate gullying.

Key indicators of approach to transition:

- Reduction in western wheatgrass and alkali sacaton cover and increase in size and frequency of bare patches.
- Increase in cover of blue grama, galleta, ring muhly and mat muhly.
- The formation of trails, gullies or other features that disrupts natural overland flow

Transition back to Grassland (1b) The natural hydrology of the site must be restored. Erosion control structures, shaping or filling gullies, culverts, turnouts, or moving or re-routing obstructions may be necessary to restore natural run-on flow patterns. Prescribed grazing will help restore and maintain adequate grass cover.

Shrub-Dominated: This state is characterized by the predominance of shrubs, especially rabbitbrush. Broom snakeweed and cacti species may also increase in representation. Blue grama, galleta, and alkali sacaton are typically the dominant grass species. However, alkali sacaton may be sparse if the transition to this state was from the Dry Grassland.

Diagnosis: Rabbitbrush is found at increased densities relative to the Grassland state. Grass cover is patchy with large bare areas present. Evidence of erosion including pedestalling of plants, elongated water flow patterns, litter dams, and rills or gullies is common.

Transition to Shrub-Dominated (2, 3a) Loss of grass cover and resulting decreased competition by grasses is believed to initiate this transition. The loss of grass cover may be due to a change in hydrology, overgrazing, or other disturbance such as fire. Rabbitbrush is believed to increase under heavy grazing pressure[4] and after 1-3 years following fire[5].
Key indicators of approach to transition:

- Decrease or change in composition or distribution of grass cover.
- Increase in size and frequency of bare patches.
- Increase in amount of shrub seedlings.

Transition back to Grassland (3b) Brush control is necessary to initiate the transition back to the grassland state. Chemical control has been shown to be effective in controlling rabbitbrush.[1, 3] Root plowing and other mechanical methods that sever the plant below the root crown may reduce rabbitbrush densities. Follow up treatment may be necessary. Prescribed grazing will help ensure adequate rest following brush control and will assist in the establishment and maintenance of grass cover. In addition the natural hydrology of the site must be restored if the transition pathway was from Dry Grassland to Shrub-Dominated (2). See Transition Back to Grassland (1b).

Bare State: Extensive areas of bare ground characterize this site. Surface soils in most bare areas are sealed over with physical crusts. Herbaceous cover consists mainly of annuals. If perennial grasses are present, they occur only in isolated patches.

Diagnosis: Annuals are the dominant herbaceous vegetation. Extensive interconnected bare areas are common with scattered or no grass plants. Evidence of erosion such as rills and gullies are present.

Transition to Bare State (4) The continued loss of remaining grass cover due to overgrazing or soil drying may cause this transition. The subsequent sealing of the soil surface by physical crusts reduces infiltration and inhibits grass reestablishment.2

Transition back to Grassland (5) The hydrology of the site must be restored first (see 1b). Seeding is necessary to reestablish grasses. Prescribed grazing will help ensure adequate rest and proper forage utilization following grass establishment. The degree to which this site is capable of recovery depends on the restoration of hydrology, the extent of degradation to soil resources, and adequate rainfall necessary to establish grasses.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community:
Wildlife species indigenous to this site will be added when data is available.

Hydrology Functions:
The runoff curve numbers are determined by field investigations using hydrologic cover conditions and hydrologic soil groups.

Hydrologic Interpretations	
Soil Series	Hydrologic Group
Crown clay loam	D
Kimbeto clay loam (McKinley Co.)	C
Moncha silty clay loam	C
Silkie clay loam	C
Teco variant (mapped in Cibola Co.)	C
Las Lueas loam	C
Moriarity silty clay	D

Recreational Uses:

This site offers a limited opportunity for establishing small intermittent water areas in the form of pit tanks. It has the potential for hiking, observing wildlife, horseback riding, photography, picnicking and camping. Trail establishment for hiking or horseback riding should be selected with care. Frequently used trails could create opportunities for overland flow to channelize and form gullies.

Wood Products:

This site has no value for wood products.

Other Products:

Other Information:

This site is suitable for grazing by all kinds and classes of livestock. Excessive grazing use over a prolonged period will result in a decrease of alkali sacaton, western wheatgrass and spike muhly. Blue grama and galleta may increase initially, but will eventually decrease if the heavy grazing continues. The site then becomes subject to the invasion of broom snakeweed, rabbitbrush and cacti. Ring muhly, threeawns, Russian thistle and tansy mustard increase significantly. The site may become severely eroded with deep vertical walled gullies when plant cover decreases.

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index	Ac/AUM
100 - 76	3.5- 4.5
75 – 51	4.5- 6.5
50 – 26	6.5- 10.0
25 – 0	10.0+

Plant Preference by Animal Kind:

	Code	Species Preference	Code
Stems	S	None Selected	N/S
Leaves	L	Preferred	P
Flowers	F	Desirable	D
Fruit/Seeds	F/S	Undesirable	U
Entire Plant	EP	Not Consumed	NC
Underground Parts	UP	Emergency	E
		Toxic	T

Animal Kind: Livestock

Animal Type: Cattle

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Alkali sacaton	Sporobolus airoides	EP	D	D	D	D	D	P	P	P	D	D	D	D
Western wheatgrass	Pascopyrum smithii	EP	D	D	P	P	P	D	D	D	D	D	D	D
Vine mesquite	Panicum obtusum	EP	D	D	D	D	D	D	D	D	P	P	D	D
Spike muhly	Muhlenbergia wrightii	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Giant sacaton	Sporobolus wrightii	EP	D	D	D	D	D	P	P	P	D	D	D	D
Bottlebrush squirreltail	Elymus elymoides	EP	U	U	D	D	D	U	U	U	D	D	D	U
Winterfat	Krascheninnikovia lanata	EP	D	D	P	P	P	P	P	P	D	D	D	D
Fourwing saltbush	Atriplex canescens	EP	P	P	P	P	P	D	D	D	D	D	D	P
Indian ricegrass	Achnatherum hymenoides	EP	P	P	P	P	P	P	P	P	P	P	P	P

Supporting Information

Associated Sites:

Site Name	Site ID	Site Narrative

Similar Sites:

Site Name	Site ID	Site Narrative

State Correlation:
This site has been correlated with the following states:

Inventory Data References:

Data Source	Number of Records	Sample Period	State	County

Type Locality:

Relationship to Other Established Classifications:

Other References:

References

1. Cluff, G.J., B.A. Roundy, R.A. Evans, and J.A. Young. 1983. Herbicidal control of greasewood (Sarcobatus vermiculatus) and salt rabbitbrush (Chrysothamnus nauseosus ssp. consimilis). Weed Science. 31: 275-279.

2. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheet. Rangeland Soil Quality—Physical and Biological Soil Crusts. Rangeland Sheet 7 [Online]. Available: http://www.statlab.iastate.edu/survey/SQI/range.html

3. Whisenant, S.G. 1988. Control of threadleaf rubber rabbitbrush with herbicides. Journal of Range Management. 41: 470-472

4. Whitson, T.D. (ed.). 1999. Weeds of the West. The Western Society of Weed Science, Wyoming. pp 103

5. Wright, H. A. 1972. Shrub response to fire. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/[2004].

Data collection for this site was done in conjunction with the progressive soil surveys within the New Mexico and Arizona Plateaus & Mesas Major Land Resource Area of New Mexico. This site has been mapped and correlated with soils in the following soil surveys: McKinley, Catron, Cibola, Socorro and Sandoval.

Characteristic Soils Are:	
Crown clay loam 3-8%	Kimbeto clay loam 1-8%
Moncho silty clay loam 4-8%	Teco 4-8%
Silkie clay loam	

Other Soils included are:	

Site Description Approval:

Author	Date	Approval	Date
Don Sylvester	05/09/84	Don Sylvester	05/09/84

Site Description Revision:

Author	Date	Approval	Date
Brenda Simpson	07/24/02	George Chavez	6/10/05
David Trujillo	6/10/05		